

**⊠**Urgent

□ Return reply requested

□ Original will be sent as confirmation

United States Patent and Trademark Office

Date:

February 24, 2003

Attention: Examiner Leonardo Andujar

Re:

U.S. Utility Patent Application

Appl. No. 09/783,034; Filed: February 15,

2001

For:

Die-Down Ball Grid Array Package With Die-Attached Heat Spreader and Method for Making

the Same

Inventors:

Khan et al.

Pages (including cover sheet): 61 Pages

Our Reference: 1875.0210000/JSW

Fax No: 703 746 4118

From: Jeffrey S. Weaver

## Message

Examiner Andujar,

Pursuant to our telephone conversation earlier today, we are submitting copies to you by facsimile of the following documents previously submitted to the USPTO, along with copies of corresponding postcards date stamped by the USPTO:

Amendment and Reply submitted June 26, 2002; 1.

Supplemental Information Disclosure Statement and accompanying PTO-1449 form submitted 2. August 30, 2002; and

Information Disclosure Statement and accompanying PTO-1449 form submitted June 26, 2002. 3.

> Certification of Facsimile Transmission I hereby certify that this paper is being facsimile transmitted to the Patent and Trademark Office on the date shown below.

> > univ D. Wise

If any portion of this transmission is not received clearly or in full, contact us at 202.371.2600 or f 202.371.2540.

This message is intended for the exclusive use of the individual or entity to which it is addressed. The message may contain information that is privileged, confidential, or otherwise exempt from disclosure under applicable law. If the render of this message is not the intended recipient, you are hereby notified that any dissemination, distribution, copying or use of this communication in any way is strictly prohibited. If you have received this communication in error, please call us collect immediately, and return the original message to us at the above address via the U.S. Postol Service.

Steme, Kessler, Goldstein & Fox Pll.c.: 1100 New York Avenue, NW: Washington, DC 20005: 202.371.2600 f 202.371.2540: www.skqf.com (CF\_DC1:105028.1

#7 Il

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Khan et al.

Appl. No. 09/783,034

Filed: February 15, 2001

For:

Die-Down Ball Grid Array

Package with Die-Attached Heat Spreader and Method for Making

the Same (As Amended)

Confirmation No. 5713

Art Unit: 2826

Examiner: Andujar, L.

Atty. Docket: 1875.0210000

## Information Disclosure Statement

Commissioner for Patents Washington, D.C. 20231

Sir:

Listed on accompanying Form PTO-1449 are documents that may be considered material to the examination of this application, in compliance with the duty of disclosure requirements of 37 C.F.R. §§ 1.56, 1.97 and 1.98.

Where the publication date of a listed document does not provide a month of publication, the year of publication of the listed document is sufficiently earlier than the effective U.S. filing date and any foreign priority date so that the month of publication is not in issue. Applicants have listed publication dates on the attached PTO-1449 based on information presently available to the undersigned. However, the listed publication dates should not be construed as an admission that the information was actually published on the date indicated.

Applicants reserve the right to establish the patentability of the claimed invention over any of the information provided herewith, and/or to prove that this information may not

Khan et al. Appl. No. 09/783,034

be prior art, and/or to prove that this information may not be enabling for the teachings purportedly offered.

This statement should not be construed as a representation that a search has been made, or that information more material to the examination of the present patent application does not exist. The Examiner is specifically requested not to rely solely on the material submitted herewith.

Applicants have checked the appropriate boxes below.

- of filing of a national application other than a continued prosecution application (CPA), OR within three months of the date of entry of the national stage as set forth in 37 C.F.R. § 1.491 in an international application, OR before the mailing date of a first Office Action on the merits OR before the mailing of a first Office Action after the filing of a request for continued examination under 37 C.F.R. § 1.114. No statement or fee is required.
- 2. This Information Disclosure Statement is being filed more than three months after the U.S. filing date AND after the mailing date of the first Office Action on the merits, but before the mailing date of a Final Rejection, or Notice of Allowance, or an action that otherwise closes prosecution in the application.
  - □ a. I hereby state that each item of information contained in this Information Disclosure Statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Information Disclosure Statement. 37 C.F.R. § 1.97(e)(1).
  - □ b. I hereby state that no item of information in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application and, to my knowledge after making reasonable inquiry, was known to any individual designated

in 37 C.F.R. § 1.56(c) more than three months prior to the filing of this Information Disclosure Statement. 37 C.F.R. § 1.97(e)(2).

Solution C. Attached is our Check No. 35656 in the amount of \$ 180.00 in payment of the fee under 37 C.F.R. § 1.17(p).

- □ 3. This Information Disclosure Statement is being filed more than three months after the U.S. filing date and after the mailing date of a Final Rejection or Notice of Allowance, but before payment of the Issue Fee. Enclosed find our Check No. \_\_\_\_\_ in the amount of \$ \_\_\_\_\_ in payment of the fee under 37 C.F.R. § 1.17(p); in addition:
  - □ a. I hereby state that each item of information contained in this Information

    Disclosure Statement was cited in a communication from a foreign

    patent office in a counterpart foreign application not more than three

    months prior to the filing of this Information Disclosure Statement.

    37 C.F.R. § 1.97(e)(1).
  - □ b. I hereby state that no item of information in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application and, to my knowledge after making reasonable inquiry, was known to any individual designated in 37 C.F.R. § 1.56(c) more than three months prior to the filing of this Information Disclosure Statement. 37 C.F.R. § 1.97(e)(2).
- □ 4. The document(s) was/were cited in a search report by a foreign patent office in a counterpart foreign application. Submission of an English language version of the search report that indicates the degree of relevance found by the foreign office is provided in satisfaction of the requirement for a concise explanation of relevance. 1138 OG 37, 38.
- □ 5. A concise explanation of the relevance of the non-English language document(s) appears below:
- Copies of the documents were cited by or submitted to the Office in an IDS that complies with 37 C.F.R. § 1.98(a)-(c) in Application No.\_\_\_\_\_\_, filed \_\_\_\_\_, which is relied upon for an earlier filing date under 35 U.S.C.

-4-

Khan et al. Appl. No. 09/783,034

١

§ 120. Thus, copies of these documents are not attached. 37 C.F.R. § 1.98(d).

It is respectfully requested that the Examiner initial and return a copy of the enclosed PTO-1449, and indicate in the official file wrapper of this patent application that the documents have been considered.

The U.S. Patent and Trademark Office is hereby authorized to charge any fee deficiency, or credit any overpayment, to our Deposit Account No. 19-0036.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.

Jeller S. Ween

Jeffrey S. Weaver

Attorney for Applicants

Registration No. 45,608

Date: 6-26-02

1100 New York Avenue, N.W. Suite 600 Washington, D.C. 20005-3934 (202) 371-2600

::ODMA\MHODMA\SKGF\_DCI;26970;1 SKGF Rev. 1/24/02 mac

Page 1 of 20 ATTY. DOCKET NO. 1875.0210000 APPLICATION NO. 09/783,034 FORM PTO-1449 APPLICANT Khan et al SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT FILING DATE GROUP 2826 Pebruary 15, 2001 **U.S. PATENT DOCUMENTS** EXAMINER INITIAL DOCUMENT DATE NAME CLASS SUB-FIUNG DATE NUMBER CLASS AA1 5,397,921 03/1995 Karnezos 779 257 AB1 12/1995 5,474,957 Urushima 437 209 AC1 5,534,467 07/1996 Rostoker 437 209 AD1 09/984,259 Zhao et al. 10/29/2001 AE1 09/997,272 Zhao et al. 11/30/2001 ---AF1 09/742,366 Khan et al. 12/22/2000 AG1 VAHT AI1 FOREIGN PATENT DOCUMENTS EXAMINER INITIAL DOCUMENT NUMBER COUNTRY DATE CLASS SUB-TRANSLATION CLASS AJ1 EP 0 504 411 B1 06/1998 EPO H01L 23/04 Yes No AK1 Yes No AL1 Yes No AMI Yes Νo OTHER (Including Author, Title, Date, Pertinent Pages, etc.) Ahn, S.H. and Kwon, Y.S., "Popcorn Phenomena in a Ball Grid Array Package", IEEE ΑN Transactions on Components, Packaging, and Manufacturing Technology Part B: Advanced 1 Packaging, IEEE, August 1995, Vol. 18, No. 3, pp. 491-96. Amkor Electronics, "Amkor BGA Packaging: Taking The World By Storm", Electronic Packaging AO 1 & Production, Cahners Publishing Company, May 1994, page unknown. Anderson, L. and Trabucco, B., "Solder Attachment Analysis of Plastic BGA Modules", Surface ΑP Mount International Conference, Surface Mount International, August 28-September 1, 1994, 1 San Jose, California, pp. 189-194. Andrews, M., "Trends in Ball Grid Array Technology," Ball Grid Array National Symposium, AQ 1 March 29-30, 1995, Dallas, Texas, 10 pages. Attarwala, A.I. Dr. and Stierman, R., "Failure Mode Analysis of a 540 Pin Plastic Ball Grid AR 1 Array", Surface Mount International Conference, Surface Mount International, August 28-September 1, 1994, San Jose, California, pp. 252-257. **EXAMINER** DATE CONSIDERED **EXAMINER:** Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in

conformance and ant considered linclude convent the form with and a

		Page 2 of 20
	ATTY. DOCKET NO. 1875.0210000	APPLICATION NO. 09/783,034
FORM PTO-1449  SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT	APPLICANT Khan et al.	
ODMANMHODMA\SKGF_0C1;264bB;1	FILING DATE February 15, 2001	GROUP 2826

					U.\$. I	PATER	T DOCUMENTS			
EXAMINER INITIAL		DO NU	OCUMENT MASER	DAT	E	NA	ME	CLASS	SUB- CLASS	FIUNG DATE
	AA2	TI							7	1
	AB2	<u> </u>				I				
	AC2	Y				$\Box$			_L	
	AD2	$oxed{oxed}$								
	AE2	1				<u> </u>				
	AF2	<u> </u>				$oxed{oxed}$				
	AG2	$\bot$	<u> </u>	<u> </u>		<u> </u>				
	AH2	$\perp$	<u> </u>			<u> </u>				
	Al2	نِـــــــــــــــــــــــــــــــــــــ	<u> </u>			L				
		<del>-                                    </del>			FOREIG	N PAT	ENT DOCUMENTS			
EXAMINER INITIAL		00	CUMENT NUM	BER	DATE		COUNTRY	CLASS	SUB- CLASS	TRANSLATION
	AJ2									Yes No
	AK2	$\top$							1	Yes
	<del>- </del> -	<del> </del>	<del></del>		<del> </del>				<del></del>	No
	AL2			· · · · ·						Yes No
	AM2									Yes
		<u> Т</u>	OTHER	/Incl	Lang Audi		l tile, Dale, Perlinent I	n		No
	AN	<u>2</u>					e Slightly Larger Tha			
	AO	2	Journal of S	ה.ט., iurfac	e Mount T	ing ai	nd Die Selection Str ology, October 199	ategles for Cost E 4, pp. 4-9,	iffective Mo	CM Designs",
	AP	2	Bernier, W.I Component Internationa	E. et : 5", St al, Au	al., "BGA v urface Mou gust 28-Si	vs. Qf unt In epten	FP: A Summary of T Iternational Confere Inber1, 1994, San Jo	radeoffs for Selectings, ise, California, pp	ction of Hig Surface M . 181-185.	jh I/O ount
	AQ	2	Burgos, J. e Study of Pla Technology	t al., stic F Part	"Achieving 'ackages", A, IEEE, D	J Acc IEEE )ecen	urate Thermal Chara Transactions on Co ber 1995, Vol. 18, I	acterization Using Imponents, Pack No. 4, pp. 732-73	a CFD Coo aging, and 38.	de A Case Manufacturing
	AR	<u>2</u>	Chadima, M Symposium,	., "In , Dall	terconnect as, Texas,	ting \$ Marc	Structure Manufactu h 29-30, 1995.	ring Technology,	" Ball Grid /	Array National
EXAMINER			1					DATE CONS	IDERED	
EYAMINED: In	Hall Mach						in conformance with A	1252 (22 2 1		

**EXAMINER:** Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant.

		PARM	7770 144A				TTY, DOCKET NO. 875.0210000			ICATION NO	Page 1 01 20
Citory covers			PTO-1449				APPLICANT Than et al.			_	· <u> </u>
BOFFLEMENT	WI TIME	OKMA	TION DISCLOS	UKE: S	TATEMENT	F	'ILING DATE		GROU		
			<del>-</del> -	<u> </u>	II S P	-	ebruary 15, 2001	<del>- ,,,,</del>	2826		
EXAMINER	T	T	<del></del>	Γ	V-4, F	A I E	AI DOCUMENTS			T -	1
INITIAL			CUMENT JMBER			NA	IAME		A\$\$	SUB- CLASS	FIUNG DATE
	AA3		<del></del>	<u> </u>		_					
	AB3		· · · · · · · · · · · · · · · · · · ·			<u> </u>					
	AC3	<del></del>				<u> </u>	· · · · · · · · · · · · · · · · · · ·				
<del></del>	AD3	╁┈		<b></b>		<u> </u>				_	
	AE3	-				<b> </b>					
	AF3 AG3	+							<del></del>		<u> </u>
	AH3	+								<del> </del>	<b>-</b>
	Al3	+				-				-	
	1740				FODEIGN	L DA1	TENT DOCUMENTS				
EXAMINER		T				115	The state of the s			1	
INITIAL		00	CUMENT NUM	BER	DATE		COUNTRY	CI	A\$\$	SUB- CLASS	TRANSLATION
	ELA										Yes No
	AK3										Yes No
	AL3								······································		Yes
	AM3	1			_						No Yes
			OTHER	(Incl	udlas Assis	*	ltie, Date, Pertinent	<b>D</b>		l	No
				/	ounty Auth	Ji, I	me, pale, reminem	rages, etc.)			
	AN	<u>3</u>	Chanchani, Packaging, I	R. et IHS F	al., "Mini B Publishing G	GA: Frou	Pad and Pitch Ease p, May/June 1995,	Die Test a pp.34, 36-3	nd Han 7.	ndling", Adv	vanced
	AO	3	Chung, T.C. Array Nation	et al al Sy	., "Rework mposium f	of P Proc	Plastic, Ceramic, and eedings, Dallas, Tex	Tape Ball (as, March 2	Grid An 29-30,	ray Assemi 1995, pp. 1	olies", Ball Grid I-15,
	АР	<u>3</u>	Cole, M.S. a Surface Mou 4-11.	nd Ci int Te	aulfield, T. echnology,	"A R Surf	Leview of Available I	Ball Grid An ogy Associa	ay (BG tlon, Ja	A) Package anuary 199	es", Journal of 6, Vol. 9, pp.
	ΑQ	<u>3</u>	Cole, M.S. a Conference California, p	nd Ca Proce p. 14	aulfield, T., edings, Su 7-153.	"Ba rfac	II Grid Array Packag e Mount Internation	ing", Surfac al, August :	e Mou 28-Sep	nt Internat tember1, 1	ional 994, San Jose,
	AR	3	Dobers, M. a Advanced Pa and 32.	nd S Ickag	eyffert, M., ing, IHS Pu	"Lo ıblis	w Cost MCMs; BGA hing Group, Septem	s Provide a ber/Octobe	Fine-Pi r 1994	tch Alterna , Vol. 3, No	itive", o. 5, pp. 28, 30
EXAMINER								DATE	CONSI	DERED	
EXAMINER: Init	ial if refe	rence	considered, wh	ether	or not citatio	on is	in conformance with A	MPEP 609. D	raw line	through cite	ation if not in
ontompance and	i not con	sidere	ed. Include copy	r of th	is form with	next	communication to Apr	plicant		<b>Q</b>	

 $\sum_{i} \left\{ (\theta^{(i)}, \phi^{(i)}) \right\}$ 

:;ODMA\MHODMA\\$KGF\_DC1;26458;1

Page 4 of 20 ATTY. DOCKET NO. APPLICATION NO. 1875.0210000 09/783,034 FORM PTO-1449 APPLICANT Khan et al SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT FILING DATE GROUP February 15, 2001 2826 **U.S. PATENT DOCUMENTS EXAMINER** INITIAL DOCUMENT DATE NAME CLASS SUB-FILING DATE NUMBER CLASS AA4 AB4 AC4 AD4 AE4 AF4 AG4 AH4 Al4 FOREIGN PATENT DOCUMENTS **EXAMINER** INITIAL DOCUMENT NUMBER DATE COUNTRY CLASS SUB-TRANSLATION **CLASS** AJ4 Yes No AK4 Yes No AL4 Yes No Yes No OTHER (Including Author, Title, Date, Pertinent Pages, etc.) Dody, G. and Burnette, T., "BGA Assembly Process and Rework", Journal of Surface Mount Technology, Surface Mount Technology Association, January 1996, Vol. 9, pp. 39-45. AN 4 Edwards, D. et al., "The Effect of Internal Package Delaminations on the Thermal Performance of PQFP, Thermally Enhanced PQFP, LOC and BGA Packages", 45th Electronic Components & Technology Conference, IEEE, May 21-24, 1995, Las Vegas, NV, pp. 285-292. AO 4 Ejim, T.L. et al., "Designed Experiment to Determine Attachment Reliability Drivers for PBGA Packages", Journal of Surface Mount Technology, Surface Mount Technology Association, January 1996, Vol. 9, pp. 30-38. ΑP 4 Ewanich, J. et al., "Development of a Tab (TCP) Ball Grid Array Package", Proceedings of the 1995 International Electronics Packaging Conference, San Diego, CA, September 24-27, 1995, pp. 588-594. AQ 4 Fauser, S. et al, "High Pin-Count PBGA Assembly", Circuits Assembly, February 1995, Vol 6, No. 2, pp. 36-38 and 40. AR <u>4</u> **EXAMINER** DATE CONSIDERED **EXAMINER:** Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant.

:

Page 5 of 20 ATTY. DOCKET NO. APPLICATION NO. 1875.0210000 09/783,034 FORM PTO-1449 APPLICANT Khan et al. SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT FILING DATE GROUP February 15, 2001 2826 U.S. PATENT DOCUMENTS EXAMINER INITIAL DOCUMENT DATE NAME CLASS SUB-FILING DATE NUMBER CLASS AA5 AB5 AC5 AD5 AE5 AF5 AG5 AH5 AI5 **FOREIGN PATENT DOCUMENTS EXAMINER** INITIAL DOCUMENT NUMBER DATE COUNTRY CLA\$\$ SUB-TRANSLATION CLASS AJ5 Yes Nο AK5 Yes No AL5 Yes No AM5 Yes No OTHER (Including Author, Title, Date, Pertinent Pages, etc.) Fauser, Suzanne et al., "High Pin Count PBGA Assembly: Solder Defect Failure Modes and Root Cause Analysis", Surface Mount International, Proceedings of The Technical Program, Surface Mount International, August 28-September1, 1994, San Jose, California, pp. 169-174. ΑN 5 Ferguson, M. "Ensuring High-Yield BGA Assembly", Circuits Assembly, February 1995, Vol. 6, No. 2, pp. 54, 56 and 58. AO <u>5</u> Freda, M., "Laminate Technology for IC Packaging", Electronic Packaging & Production, Cahners Publishing Company, October 1995, Vol. 35, No. 11, pp. S4-S5. AP <u>5</u> Freedman, M., "Package Size and Pin-Out Standardization", Ball Grid Array National Symposium, March 29-30, 1995, 7 pages. ΑQ <u>5</u> Freyman, B. and Pennisi, R., "Over-molded Plastic Pad Arrary Carriers (OMPAC): A Low Cost, High Interconnect Density IC Packaging Solution for Consumer and Industrial Electronics", 41st Electronic Components & Technology Conference, IEEE, May 11-16, 1991, pp. 176-82. AR <u>5</u> **EXAMINER** DATE CONSIDERED **EXAMINER:** Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant.

Page 6 of 20 ATTY. DOCKET NO. APPLICATION NO. 1875.0210000 09/783,034 FORM PTO-1449 APPLICANT Khan et al. SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT FILING DATE GROUP February 15, 2001 2826 **U.S. PATENT DOCUMENTS EXAMINER** INITIAL DOCUMENT DATE NAME CLA\$5 SUB-FILING DATE NUMBER CLASS AA6 AB6 AC6 AD6 AE6 AF6 AG6 AH6 Al6 FOREIGN PATENT DOCUMENTS EXAMINER INITIAL DOCUMENT NUMBER DATE COUNTRY CLASS SUB-TRANSLATION CLASS AJ6 No AK6 Yes Νο AL6 Yes No AM6 Yes No OTHER (Including Author, Title, Date, Pertinent Pages, etc.) Freyman, B. et al., "Surface Mount Process Technology for Ball Grid Array Packaging", Surface Mount International Conference Proceedings, Surface Mount International, August 29-September 2, 1993, San Jose, California, pp. 81-85. AN <u>6</u> Freyman, B. et al., "The Move to Perimeter Plastic BGAs", Surface Mount International Conference Proceedings, San Jose, CA, August 29-31, 1995, pp. 373-382. ΑQ 6 Freyman, B., "Trends in Plastic BGA Packaging," Ball Grid Array National Symposium, Dallas, Texas, March 29-30, 1995, 45 pages. ΑP 6 Gilleo, K., "Electronic Polymers: Die Attach and Oriented Z-Axis Films", Advanced Packaging, IHS Publishing Group, September/October 1994, Vol. 3, No. 5, pp. 37-38, 40 and 42. AQ <u>6</u> Guenin, B. et al., "Analysis of a Thermally Enhanced Ball Grid Array Package", IEEE Transactions on Components, Packaging, and Manufacturing Technology, Part A, IEEE Components, Packaging, and Manufacturing Technology Society, December 1995, Vol. 18, No. 4, pp. 749-757. AR <u>6</u> EXAMINER DATE CONSIDERED **EXAMINER:** Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant.

::ODMANHODMANSKGF\_DC1;2445B;7

Page 7 of 20 ATTY. DOCKET NO. APPLICATION NO. 1875.0210000 09/783,034 FORM PTO-1449 APPLICANT Khan et al. SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT FILING DATE GROUP 2001 Pebruary 15, 2826 U.S. PATENT DOCUMENTS EXAMINER INITIAL DOCUMENT DATE NAME CLASS SUB-FILING DATE NUMBER **CLASS** AA7 AB7 AC7 AD7 AE7 AF7 AG7 AH7 AI7 FOREIGN PATENT DOCUMENTS **EXAMINER** INITIAL DOCUMENT NUMBER DATE COUNTRY CLASS SUB-TRANSLATION CLASS AJ7 Yes No AK7 Yes No AL7 Yes No AM7 Yes No OTHER (Including Author, Title, Date, Perlinent Pages, etc.) Hart, C., "Vias in Pads for Coarse and Fine Pitch Ball Grld Arrays", Surface Mount International Conference Proceedings, Surface Mount International, August 28-September1, 1994, San Jose, California, pp. 203-207. <u>Z</u> AN Hart, C. "Vias in Pads", Circuits Assembly, February 1995, Vol. 6, No. 2, pp. 42, 44-46 and 50. AO <u>Z</u> Hattas, D., "BGAs Face Production Testing: New Package Offers Promise but Must Clear Technology Hurdles.", Advanced Packaging, IHS Publishing Group, Summer 1993, Vol. 2, No. 3, pp. 44-46. ΑP <u>7</u> Heitmann, R., "A Direct Attach Evolution: TAB, COB and Flip Chip Assembly Challenges", Advanced Packaging, IHS Publishing Group, July/August 1994, Vol. 3, No. 4, pp. 95-99 and 103. ΑQ <u>Z</u> Hodson, T., "Study Examines BGA Use", Electronic Packaging & Production, March 1993, page AR Z unknown. **EXAMINER** DATE CONSIDERED **EXAMINER:** Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant,

# #		DOCUMENT	LOSURE	U.S. P	AFI Kha FII Fel	TY. DOCKET NO. 75.0210000  PLICANT an et al.  LING DATE bruary 15, 2001			ICATION NE	0.
EXAMINER NITIAL	INFOI	DOCUMENT	LOSURE	U.S. P	Kha FII Fel	an et al. LING DATE				
EXAMINER NITIAL	AAB ABB	DOCUMENT		U.S. P	FII Fe	LING DATE		CPOT		
NITIAL A	AB8		DAT		Fe					
NITIAL A	AB8		DAT		MATERI	Druary 13, 2001		2826		·
NITIAL A	AB8		DAT		ALEN	T DOCUMENTS	<del></del>			<del></del>
# #	AB8							CLASS SUB- CLASS		FILING DATE
<i>F</i>		4								
1	ACR :									
					<u> </u>					
1 4	AD8	<u> </u>							<del></del>	
	AE8								<del>-</del>	
	AF8				<del> </del>				<del></del>	
	AG8 AH8			<del></del>	<del> </del>					
	AI8				<del>                                     </del>	* ***			<del> </del>	-
				FOREIGN	N PATE	NT DOCUMENTS	<u> </u>			
XAMINER NITIAL		DOCUMENT I	NUMBER	DATE		COUNTRY	CI	ASS	SUB-	TRANSLATION
	AJ8								CLASS	Yes
	-			i			ľ		1	No.
<del></del>	AK8	·.		<u> </u>						Yes
<u> </u>		· · · · · · · · · · · · · · · · · · ·								No
ΙΑ	428					•				Yes No
A	884									Yes No
		ρ1	THER (Inc	udina Auth	or. Titi	le, Date, Pertinent F	anes, etc.)			1 140
			(1,1,1	3	100, 000		4947 51617			
AI	W	Holden, Interco Diego,	, H., "The nnecting CA, Janua	Many Tec and Packa ary 18-19,	chnique ging E 1996,	es of Small Via Ford lectronic Circuits Bo pp. 1-7.	mation for all Grid Arr	Thin E ay Nat	loards", Th ional Symp	e Institute for posium, San
A	0 1	Hought Winter	en, J., "N 1993, Vo	lew Packag l. 2, No. 1,	je Tak pp. 31	es On QFPs", Adva 8-39.	nced Packa	aging,	IHS Publish	ning Group,
Al	P §	How T January	o Give Yo /Februar	our BGAs A y 1995, pa	Bette	r Bottom Line.", Aç known.	Ivanced Pa	ckagin	g, IHS Pub	llshing Group,
A	Q <u>I</u>	Huang, by Simu West '9	W. and f lation an 5, Februa	Ricks, J.,"El d Measure ary 26-Marc	lectrica ment" ch 2, 1	al Characterization , National Electron 1995, Anaheim, Cal	of PBGA fo c Packagir ifornia, pp	or Com ig and . 300-3	munication Production 307.	Applications Conference
AF	R £	Hundt, and Pro 29, 199	M. et al., duction ( 6, pp. 70	"Thermal   Conference 2-711.	Enhan West	cements of Ball Gri '95, Reed Exhibitio	d Arrays", n Compan	Nation ies, An	al Electron aheim, CA,	ic PackagIng February 25-
KAMINER		· <u> </u>			~~~		DATE	CONS	IDERED	
YAMINED: Initial	if me-	nnon sonside	ed subsabbs		· !- !	n conformance with M	40ED (22 =			

::ODMANMHODMANSKGP\_DC1;26458;1

Page 9 of 20 ATTY. DOCKET NO. APPLICATION NO. 1875.0210000 FORM PTO-1449 APPLICANT Khan et al SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT FILING DATE GROUP February 15, 2826 **U.S. PATENT DOCUMENTS EXAMINER** DOCUMENT NUMBER INITIAL DATE NAME CLASS SUB-**FILING DATE** CLASS AA9 AB9 AÇ9 AD9 AE9 AF9 AG9 AH9 AI9 **FOREIGN PATENT DOCUMENTS EXAMINER** INITIAL DOCUMENT NUMBER COUNTRY DATE **ÇLASŞ** SUB-TRANSLATION CLASS AJ9 Yes Nο AK9 Yes No AL9 Yes No AM9 Yes No OTHER (Including Author, Title, Date, Pertinent Pages, etc.) Hutchins, C.L., "Understanding Grid Array Packages", Surface Mount Technology Magazine, IHS Publishing Group, November 1994, Vol. 8, No. 11, pp. 12-13. 9 Hwang, J.S., "Reliability of BGA Solder Interconnections", Surface Mount Technology Magazine, IHS Publishing Group, September 1994, Vol. 8, No. 9, pp. 14-15. AO 9 Hwang, J.S., "A Hybrid of QFP and BGA Architectures", Surface Mount Technology Magazine, IHS Publishing Group, February 1995, Vol. 9, No. 2, p. 18. 9 Johnson, R. et al., "A Feasibility Study of of Ball Grid Array Packaging", National Electronic Packaging and Production Conference East '93, Boston, Massachusetts, June 14-17, 1993, pp. 413-422. ΑQ 2 Johnson, R. et al., "Thermal Characterization of 140 and 225 Pln Ball Grid Array Packages", National Electronic Packaging & Production Conference East '93, Boston, Massachusetts, June 9 AR 14-17, 1993, pp. 423-430. **EXAMINER** DATE CONSIDERED **EXAMINER:** Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant.

Page 10 of 20 ATTY. DOCKET NO. APPLICATION NO. 1875.0210000 FORM PTO-1449 APPLICANT Khan et al SUPPLEMENTAL INPORMATION DISCLOSURE STATEMENT FILING DATE GROUP 2826 February 15, 2001 **U.S. PATENT DOCUMENTS EXAMINER** INITIAL DOCUMENT DATE NAME CLASS SUB-**FILING DATE** NUMBER CLASS AA10 AB10 AC10 **AD10** AE10 AF10 **AG10** AH10 Al10 **FOREIGN PATENT DOCUMENTS** FYAMINER COUNTRY CLASS DOCUMENT NUMBER DATE SUB-TRANSLATION INITIAL CLASS AJ10 Yes No Yes AK10 No AL10 Yes Nο Yes **AM10** Nο OTHER (Including Author, Title, Date, Pertinent Pages, etc.) Johnston, P., "Land Pattern Interconnectivity Schemes", Ball Grid Array National Symposium, Dallas, Texas, March 29-30, 1995, pages 2-21. AN <u>10</u> Johnston, P. "Printed Circuit Board Design Guidelines for Ball Grid Array Packages", Journal of Surface Mount Technology, Surface Mount Technology Association, January 1996, Vol. 9, pp. AO 10 Kawahara, T. et al., "Ball Grid Array Type Package By Using of New Encapsulation Method", Proceedings of the 1995 International Electronics Packaging Conference, San Diego, CA, September 24-27, 1995, pp. 577-587. <u>10</u> Knickerbocker, J.U. and Cole, M.S., "Ceramic BGA: A Packaging Alternative", Advanced Packaging, IHS Publishing Group, January/February 1995, Vol. 4, No. 1, pp. 20, 22 and 25. AQ 10 Kromann, G., et al., "A Hi-Density C4/CBGA Interconnect Technology for a CMOS Microprocessor", National Electronic Packaging and Production Conference West '95, IEEE, February 26-March 2, 1995, Anaheim, California, pp. 1523-1529. AR 10 **EXAMINER** DATE CONSIDERED **EXAMINER:** Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in

conformance and not considered. Include copy of this form with next communication to Applicant.

Page 11 of 20 ATTY. DOCKET NO. APPLICATION NO. 1875.0210000 FORM PTO-1449 APPLICANT Khan et al SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT FILING DATE GROUP February 15, 2001 2826 **U.S. PATENT DOCUMENTS EXAMINER** INITIAL DOCUMENT DATE NAME CLASS SUB-FILING DATE NUMBER CLASS **AA11 AB11** AC11 AD11 AE11 AF11 AG11 **AH11** All1 **FOREIGN PATENT DOCUMENTS EXAMINER** INITIAL DOCUMENT NUMBER COUNTRY CLASS DATE SUB-TRANSLATION CLASS AJII No AK11 Yes No AL11 Yes No AM11 Yes No OTHER (Including Author, Title, Date, Pertinent Pages, etc.) Kunkle, R., "Discrete Wiring for Array Packages", Ball Grid Array National Symposium, Dallas, Texas, March 29-30, 1995, 9 pages. ΔN 11 Lall, B. et al, "Methodology for Thermal Evaluation of Multichip Modules", IEEE Transactions on Components, Packaging, and Manufacturing Technology Part A, IEEE, December 1995, Vol. 18, No. 4, pp. 758-764. AO 11 Lasance, C. et al., "Thermal Characterization of Electronic Devices with Boundary Condition Independent Compact Models", IEEE Transactions on Components, Packaging, and Manufacturing Technology Part A, IEEE Components, Packaging, and Manufacturing Technology Society, December 1995, Vol. 18, No. 4, pp. 723-731. 11 Lau, J., "Ball Grid Array Technology", McGraw-Hill Inc., 1995, entire book submitted. ΩA 11 Lau, J. et al., "No Clean Mass Reflow of Large Plastic Ball Grid Array Packages", Circuit World, Wela Publications Ltd., Vol. 20, No. 3, March 1994, pp.15-22. AR 11 **EXAMINER** DATE CONSIDERED **EXAMINER:** Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant.

Page 12 of 20

				<del></del>			TY. DOCKET NO.			ICATION NO	Page 12 of 20		
	1	PORM	PTO-1449			-	75.0210000 PLICANT		109//	93,034			
SUPPLEMEN	TAL INFO	RMAT	ION DISCLOSE	IRE S	TATEMENT		an et al.		Char				
							FILING DATE GROUP February 15, 2001 2826						
					U.S. P.	ATEN	T DOCUMENTS						
EXAMINER INITIAL			CUMENT MBER	DAT	•	NAN	NE		CLASS	SUB- CLASS	FILING DATE		
	AA12	1.10	· in the interest of the inter	<b>-</b>						1	<u> </u>		
	AB12	1						•					
	AC12												
	AD12												
	AE12		· · · · ·										
	AF12	<u>.</u>											
	AG12	<u> </u>		<u> </u>		<u> </u>			<u> </u>		Į		
	AH12	↓_		<u> </u>		<u> </u>							
	Al 12												
	- <del></del>	<del>,</del>			FOREIGN	PAT	ENT DOCUMENTS		7	1	<u>,                                      </u>		
EXAMINER INITIAL		DO	CUMENT NUM	BER	DATE		COUNTRY		CLASS	SUB- CLASS	TRANSLATION		
	AJ12						·				Yes No		
	AK12										Yes No		
	AL12			•••							Yes <b>N</b> o		
-	AM12										Yes No		
			OTHE	(Inc	uding Auth	or, Ti	tje, Date, Pertinent	Pages,	etc.)				
	AN	<u>12</u>	"Literature Cahners Pu	Revie blicat	w", Specia ion, 10 pag	ıl Sup ges.	plement to Electro	nic Pac	kaging & P	roduction,	February 1995,		
	AO	<u>12</u>	LSI LOGIC document s			or Gui	de, Second Edition	, LSI Lo	ogic Corpoi	ation, 199	4-1995, entire		
	АР	<u>12</u>	"LTCC MCM September,	ls Lea Octo	ed to Ceran ber 1994, \	nic Bi Vol. 3	GAs," Advanced Pa , No. 5, pp. 14-15	ckaging	j, IHS Publ	ishing Grou	IP,		
	AQ	<u>12</u>	Mak, Dr. W Finite Elem October 19	.C. et ent M 94, p	: al., "Incre lodeling", J p. 33-41.	ased lourna	SOIC Power Dissipal of Surface Moun	ation C t Techr	apability T hology, Sur	hrough Boa face Mount	ard Design and International,		
	AR	12	Marrs, R.C. Advanced F 50, and 52	and acka	Olachea, G ging, IHS F	., "BC Publis	GAs For MCMs: Cha hing Group, Septer	anging I mber/O	Markets an ctober 199	d Product i 4, Vol. 3, N	Functionality*, lo. 5, pp. 48,		
EXAMINER					<u>-</u>				DATE CONS	IDERED			
EXAMINER: I	nitial if rel	erence	e considered, w ed. Include co	hethe	r or not citat his form wit	tion is h next	in conformance with communication to A	MPEP 6	09. Draw lir	ne through c	itation if not in		

Page 13 of 20

				<del></del>			TY. DOCKET NO.			CATION NO			
	F	ORM P	TO-1449			API	PLICANT						
SUPPLEMENT	AL INFO	TTAME	ON DISCLOS	re s	PATEMENT	FI	an et al. LING DATE		GROUT	>			
					II S D		DOCUMENTS		2826	<u> </u>			
EVAMINED	<del></del>	_		[	U.S. P.	L	DOCUMENTS	ĺ	***				
EXAMINER INITIAL		DOC	UMENT ABER	DATE		NAM	E		CLASS	SUB- CLASS	FILING DATE		
	AA13			<u> </u>						<del> </del>			
	AB13	<u> </u>					· · · · · · · · · · · · · · · · · · ·			<u> </u>			
	AC13	_				<u> </u>				<del>                                     </del>	<b></b>		
	AD13			<b>!</b>		-							
	AE13	<del>                                     </del>				-					<del></del>		
	AF13	<del>                                     </del>											
	AG13	├						<del>-  </del>		<del>-</del>			
	AH13	╁		┥		<del>                                     </del>							
	Al13	<u>.                                    </u>		L	FOREIGN	J PATI	ENT DOCUMENTS	1					
EXAMINÉR INITIAL	Ī	DOC	LUMENT NUM	BER	DATE	* * * * * * * * * * * * * * * * * * * *	COUNTRY		ÇLASS	SUB-	TRANSLATION		
										CLASS			
	EITY				İ						Yes No		
	AK13	<u> </u>					1				Yes No		
	AL13	<del> </del>									Yes No		
	AM13	╁─	, . <del></del>								Yes No		
		<u> </u>	ATHE	D /Incl	udina Auth	or Ti	tie, Date, Pertinent	Pages, e	tc.)		110		
	$\overline{}$		V III.	<u> </u>	Adding wan	,	10, Duile, 1 Clini-1-1	, , <u>, , , , , , , , , , , , , , , , , </u>	/				
	AN	<u>13</u>	Matthew, I Packaging,	.C. et IHS I	al., "Area Publishing	Array Group	/ Packaging: KGD o, July/August 199	in a Chip- 14, pp. 91	-Sized Pad -94.	ckage", Ad	/anced		
	AO	13	Mawer, A. Internation 1994, San	ial Co	nterence H	mcee	older Joint Reliabili dings, Surface Mo 239-251.	ty Consid ount Inter	lerations" national,	, Surface N August 28:	lount September1,		
	AP	<u>13</u>	Mazzullo, 7 Technolog	r. and y Mag	Schaertl, azine, Feb	L., "H oruary	ow IC Packages A 1995, Vol. 9, No.	ffect PCB 2, pp. 11	Design", 4-116.	Surface M	ount		
	AQ	13	Mearig, J., and Produ 295-299.	Mearig, J., "An Overview of Manufacturing BGA Technology", National Electronic Packaging and Production Conference West '95, February 26-March 2, 1995, Anaheim, California, pp. 295-299.									
	AR	<u>13</u>	Mertol, A., Grid Array Technolog	"Appl Packa y Part	lication of ages", IEEE B: Advan	the Ta E Tran	aguchi Method on sactions on Comp ackaging, IEEE, N	the Robu onents, F ovember	ist Design Packaging 1995, Vo	of Molded , and Mani l. 18, No. 4	225 Plastic Ball ufacturing 1, pp. 734-743.		
EXAMINER	_1		<u> </u>		. <u>-</u>	•		Ε	ATE ÇON	SIDERED			
EXAMINER:	nitial if rel	erence	e considered,	whethe	er or not cito	otion is	s in conformance with	h MPEP 60	9. Draw li	ne through o	itation if not in		

Page 14 of 20 APPLICATION NO. ATTY. DOCKET NO. 09/783,034 1875.0210000 FORM PTO-1449 APPLICANT Khan et al SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT GROUP FILING DATE 2001 2826 February 15, U.S. PATENT DOCUMENTS EXAMINER SUB-FILING DATE CLASS DOCUMENT NUMBER DATE NAME INITIAL CLASS **AA14** AB14 AC14 AD14 AE14 AF14 **AG14** AH14 Al14 FOREIGN PATENT DOCUMENTS **EXAMINER** TRANSLATION COUNTRY CLASS DOCUMENT NUMBER DATE INITIAL CLASS AJ14 No Yes AK14 No Yes AL14 No Yes **AM14** Nο OTHER (Including Author, Title, Date, Pertinent Pages, etc.) Mescher, P. and Phelan, G., "A Practical Comparison of Surface Mount Assembly for Ball Grid Array Components", Surface Mount International Conference Proceedings, Surface Mount International, August 28-September 1, 1994, San Jose, California, pp. 164-168. AN 14 Mulgaonker, S. et al., "An Assessment of the Thermal Performance of the PBGA Family", Eleventh Annual IEEE Semiconductor Thermal Measurement and Management Symposium, IEEE, San Jose, CA, February 7-9, 1995,pp. 17-27. AO 14 "New PBGA Pushes Technology to Outer Limits", Advanced Packaging, IHS Publishing Group, January/February 1995, page 11. AP 14 Olachea, G., "Managing Heat: A Focus on Power IC Packaging", Electronic Packaging & Production (Special Supplement), Cahners Publishing Company, November 1994, pp. 26-28. AQ <u>14</u> "Pad Array Improves Density", Electronic Packaging & Production, Cahners Publishing Company, May 1992, pp. 25-26. AR 14 DATE CONSIDERED **EXAMINER EXAMINER:** Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in

conformance and not considered. Include copy of this form with next communication to Applicant.

Page 15 of 20 APPLICATION NO. ATTY. DOCKET NO. 09/783,034 1875.0210000 FORM PTO-1449 APPLICANT Khan et al. SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT GROUP FILING DATE 2826 2001 February 15, U.S. PATENT DOCUMENTS EXAMINER FILING DATE CLASS SUB-NAME DATE DOCUMENT INITIAL CLASS NUMBER **AA15** AB15 AC15 AD15 AE15 AF15 AG15 AH15 AI15 FOREIGN PATENT DOCUMENTS EXAMINER CLAS5 SUB-TRANSLATION COUNTRY DOCUMENT NUMBER DATE INITIAL CLASS Yes AJ15 Yes AK15 No Yes AL15 No Yes AM15 No OTHER (Including Author, Title, Date, Pertinent Pages, etc.) Partridge, J. and Viswanadham, P., "Organic Carrier Requirements for Flip Chip Assemblies", Journal of Surface Mount Technology, Surface Mount Technology Association, July 1994, pp. 15-20. <u> 15</u> AN Ramirez, C. and Fauser, S., "Fatigue Life Comparison of The Perimeter and Full Plastic Ball Grid Array", Surface Mount International Conference Proceedings, Surface Mount International, August 28-September1, 1994, San Jose, California, pp. 258-266. AO 15 Rogren, P., "MCM-L Built on Ball Grid Array Formats", National Electronic Packaging and Production Conference West '94, Anaheim, California, pp. 1277-1282. ΑP <u>15</u> Rooks, S., "X-Ray Inspection of Flip Chip Attach Using Digital Tomosynthesis", Surface Mount International, Proceedings of The Technical Program, August 28-September1, 1994, San Jose, California, pp. 195-202. AQ <u>15</u> Rukavina, J., "Attachment Methodologies: Ball Grid Array Technology", Ball Grid Array National Symposium, Dallas, Texas, March 29-30, 1995, 37 pages. <u>15</u> AR DATE CONSIDERED **EXAMINER** EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant.

Page 16 of 20 ATTY DOCKET NO. 1875.0210000 APPLICATION NO. 09/783,034 FORM PTO-1449 APPLICANT Khan et al. SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT GROUP FILING DATE 2826 2001 February 15, U.S. PATENT DOCUMENTS EXAMINER FILING DATE CLAS\$ SUB-NAME DOCUMENT DATE INITIAL CLASS NUMBER AA16 AB1 6 AC16 AD16 AE16 AF16 AG16 AH16 Al16 FOREIGN PATENT DOCUMENTS **EXAMINER** TRANSLATION CLASS SUB-COUNTRY DOCUMENT NUMBER DATE INITIAL CLASS Yes AJ16 No Ye5 AK16 No Yes AL16 No Yas **AM16** Νo OTHER (Including Author, Title, Date, Pertinent Pages, etc.) Sack, T., "Inspection Technology", Ball Grid Array National Symposium, Dallas, Texas, March 29-30, 1995, pages 1-41. AN 16 Sakaguchi, H., "BGA MountingTechnology," pgs. 1-4, date and source unknown. AO <u> 16</u> Schmolze, C. and Fraser, A., "SPICE Modeling Helps Enhance BGA Performance", Electronic Packaging & Production, January 1995, pp. 50-52. AΡ <u>16</u> Semiconductor Group Package Outlines Reference Guide, Texas Instruments, 1995, entire document submitted. ΑQ <u> 16</u> Shimizu, J., "Plastic Ball Grid Array Coplanrity", Surface Mount International Conference, San Jose, California, August 31-September 2, 1993, pp. 86-91. AR 16 DATE CONSIDERED EXAMINER **EXAMINER:** Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant.

Page 17 of 20 ATTY, DOCKET NO. 1875.0210000 APPLICATION NO. 09/783,034 FORM PTO-1449 APPLICANT Khan et al. SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT FILING DATE GROUP 2826 2001 February 15, U.S. PATENT DOCUMENTS EXAMINER FILING DATE SUB-CLASS DOCUMENT NUMBER DATE NAME INITIAL CLASS **AA17 AB17** AC17 AD17 **AE17 AF17** AG17 **AH17** Al17 FOREIGN PATENT DOCUMENTS EXAMINER TRANSLATION CLASS SUB-COUNTRY DATE DOCUMENT NUMBER INITIÁL CLASS Yes AJ17 No Yes **AK17** No Yas AL17 No Yes AM17 No OTHER (Including Author, Title, Date, Perlinent Pages, etc.) Sigliano, R., "Using BGA Packages: An Appealing Technology in a QFP and Fine-Pitch Market", Advanced Packaging, IHS Publishing Group, March/April 1994, pp. 36-39. <u>17</u> AN Sirois, L., "Dispensing for BGA: Automated Liquid Dispensing in a High-Density Environment", Advanced Packaging, IHS Publishing Group, May/June 1995, pp. 38 and 41. AO <u>17</u> Solberg, V., "Interconnection Structure Preparation: Impact of Material Handling and PCB Surface Finish on SMT Assembly Process Yield", Ball Grid Array National Symposium, Dallas Texas, March 29-30, 1995, 10 pages. <u>17</u> ΑP "Survival of the Fittest", Advanced Packaging, IHS Publishing Group, March/April 1995, page 17 AQ unknown. Tuck, J., "BGA Technology Branches Out", Circuits Assembly, February 1995, Vol. 6, No. 2, pp. 24, 26, and 28. AR 17 DATE CONSIDERED EXAMINER **EXAMINER**: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in

conformance and not considered. Include copy of this form with next communication to Applicant.

Page 18 of 20 APPLICATION NO. ATTY. DOCKET NO. 1875.0210000 09/783,034 FORM PTO-1449 APPLICANT Khan et al SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT GROUP FILING DATE 2826 2001 February 15, U.S. PATENT DOCUMENTS FILING DATE **EXAMINER** SUB-CLASS DOCUMENT DATE NAME CLASS INITIAL NUMBER AA1B A818 AC18 AD18 AE18 AF18 AG18 **AH18** AI18 FOREIGN PATENT DOCUMENTS EXAMINER TRANSLATION CLASS SUB-COUNTRY DOCUMENT NUMBER DATE INITIAL CLASS Yes BILA No Yes AK18 No Yes AL18 No Yes **AM18** No OTHER (Including Author, Title, Date, Pertinent Pages, etc.) "Tutorial and Short Courses", 45th Electronic Components & Technology Conference, May 21-24, 1995, Las Vegas, Nevada, IEEE, 6 pages. AN 18 Vardaman, E. J. and Crowley, R.T., "Worldwide Trends In Ball Grld Array Developments", National Electronic Packaging and Production Conference West '96, Reed Exhibition Companies, Anahelm, CA, February 25-29, 1996, pp. 699-701. AO <u> 18</u> Walshak, D. and Hashemi, H., "Thermal Modeling of a Multichip BGA Package", National Electronic Packaging and Production Conference West '94, Reed Exhibition Companies, Anahelm, California, February 27-March 4, 1994, pp. 1266-1276. AP 18 Walshak, D. and Hashemi, H., "BGA Technology: Current and Future Direction for Plastic, Ceramic and Tape BGAs", Surface Mount International Conference Proceedings, Surface Mount International, August 28-September1, 1994, San Jose, California, pp. 157-163. <u>18</u> AQ Xie, H. et al., "Thermal Solutions to Pentium Processors in TCP in Notebooks and Sub-Notebooks", 45th Electronic Components & Technology Conference, IEEE, Las Vegas, NV, May 21-24, 1995, pp. 201-210. AR 18 DATE CONSIDERED EXAMINER **EXAMINER**: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant.

Received from < 202 218 7813 > at 2/24/03 5:23:04 PM [Eastern Standard Time]

											Page 19 of 20		
					<del></del>	ATT 187	Y. DOCKÉT NO. 5.0210000		APPLI 09/78	CATION NO	· · · · · · · · · · · · · · · · · · ·		
	FO	RM PT	<b>0-1449</b>			APP	LICANT						
SUPPLEMENTA	AL INFOR	<u>MATIO</u>	N DISCLOST	RE ST	ATEMENT		n et al. ING DATE		GROUN	>			
						Feb	ruary 15, 2001		2826				
				,	U.\$. P.	<u>ATENT</u>	DOCUMENTS			T	<del></del>		
KAMINER NITIAL		DOC	JMENT BER	DATE		NAME		C	LASS	SUB- CLASS	FILING DATE		
	AA19			<u> </u>						1			
	AB19			_		-		<del></del>		+	<b>—</b>		
	AC19					├─							
	AD19	<del> </del>		├		$\vdash \vdash$							
	AE19	<u> </u>	<del></del>	├		<del>                                     </del>			~				
	AF19			├~	<del></del>								
	AG19 AH19												
	AI19												
	123117				FOREIG	N PATE	NT DOCUMENTS	<del></del>					
EXAMINER NITIAL		DOC	UMENT NUX	ABER	DATE		COUNTRY	C	LASS	SUB- CLASS	TRANSLATION		
	AJ19										Yes No		
	AK19										Yes		
	AL19	┼-							·, ·		Yes		
	AM19	<del> </del>						<del>-</del> †	<u> </u>		Ye:		
		<u>_</u> _					at Data Berlingst	Pages str					
	<del></del>	_					tle, Date, Pertinent l						
	AN	<u>19</u>	Yip, W.Y., Production Anaheim,	"Pack n Conf Califo	age Char erence W rnia, pp. 1	acteriz est '95 1530-1	ation of a 313 Pin B i, Reed Exhibition C 541.	GA", Nati ompanies	ional El s, Febru	ectronic Pa Jary 26-Ma	rckaging and rch 2, 1995,		
	AO	<u>19</u>	Zamborsk 2, pp. 60,	y, E., 62-64	"BGAs in 1	the As	sembly Process", Ci	rcuits Ass	embly,	February :	1995, Vol. 6, No.		
	AP	19	Zimermar Internation 1994, Sai	n, M., inal Co n Jose	"High Perlonference , Californi	formar Proce a, pp.	nce BGA Molded Pac edings, Surface Mou 175-180.	kages fo unt Interr	r MCM national	Application I, August 2	", Surface Moun 8-September1,		
	AQ	19	Zweig, G. (Special S	Zweig, G., "BGAs: Inspect the Process, Not the Product", Electronic Packaging & Production (Special Supplement), Cahners Publishing Company, August 1994 (Supplement), p. 41.									
	AR	19	Houghter 1995, pp	ո, J.L., . 141-	, "Plastic E 146.	Ball-Gr	id Arrays Continue	To Evolve	", Elect	tronic Desig	gn, February 6,		
EXAMINER			1					0	ATE CO	NSIDERED			
							*. *	MPED 40	0 Deau	/ line throws	h citation if not in		
EXAMINER:	Initial if r	eferen	ce considered ared. Include	copy o	her or not of f this form	itation with ne	is in conformance with an communication to A	n MPEP 60 Applicant.	y, Draw	una rutonă	II CHARLOII II NOI III		

Page 20 of 20 APPLICATION NO. ATTY. DOCKET NO. 09/783,034 1875.0210000 FORM PTO-1449 APPLICANT Khan et al SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT GROUP FILING DATE U.S. PATENT BOOUNENTS 2826 **EXAMINER** FILING DATE CLASS SUB-DATE NAME DOCUMENT INITIAL CLASS NUMBER AA20 AB20 AC20 AD20 AE20 AF20 AG20 AH20 Al20 FOREIGN PATENT DOCUMENTS TRANSLATION EXAMINER SUB-CLASS COUNTRY DATE DOCUMENT NUMBER INITIAL CLASS Yes AJ20 No Yes AK20 No Yes AL20 No Yes AM20 No OTHER (Including Author, Title, Date, Pertinent Pages, etc.) Marrs, R. et al., "Recent Technology Breakthroughs Achieved with the New SuperBGA® Package", 1995 International Electronics Packaging Conference, San Diego, California, September 24-27, 1995, pp. 565-576. AN <u> 20</u> Hayden, T.F. et al., "Thermal & Electrical Performance and Reliability Results for Cavity-Up Enhanced BGAs", Electronic Components and Technology Conference, IEEE,1999, pp. 638-644. AO 20 Thompson, T., "Reliability Assessment of a Thin (Flex) BGA Using a Polyimide Tape Substrate", International Electronics Manufacturing Technology Symposium, IEEE, 1999, pp. 207-213. ΑP <u> 20</u> AQ <u>20</u> AR 20 DATE CONSIDERED EXAMINER **EXAMINER:** Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant.